which we know as St. Mary's River is the true Belly River. This seems natural and proper, for at the point where they meet, the St. Mary's is a larger stream than Belly River.

As stated by Mr. Doty these lakes are two in number, the lower about seven miles long by a mile wide, the upper perhaps eleven miles long and nowhere more than a mile in width. The lower lake lies north and south, and the upper, Mr. Doty's Bow Lake, is bent about half-way up its length, its upper or south-western half lying nearly east and west, and its lower or northern half nearly north and south. Beyond the head of this upper lake is the narrow river-valley running back in two principal branches for a dozen miles and heading on the Continental Divide. The southernmost of the two branches is much the larger of the two, and is fed by extensive glaciers, which I have visited.

The lower end of the lower lake is not more than seven or eight miles from the Chief Mountain, the most striking landmark in this region. The waters flowing into the St. Mary's River are divided from those which flow into Cut Bank and Milk Rivers, tributaries of the Missouri, by a high ridge running out from the Rocky Mountains, and known as Milk River Ridge.

BIRDS BREEDING AT HANOVER, NEW HAMPSHIRE.

BY CLARENCE M. WEED.

THE village of Hanover, N.H., is in the region dividing the Canadian and Alleghanian faunas, and possesses many animal forms from both. To assist in determining more definitely the precise limits of these faunas, the Ornithological Club of the New Hampshire College undertook last spring to record the birds breeding within five miles of Hanover. The following list includes the species observed this season by the members of the club. Especial mention should be made of the assistance rendered by Messrs. P. L. Barker, R. A. Campbell, and C. E. Hewitt.

Green Heron, *Ardea virescens.* One nest observed.

American Woodcock, *Philohela minor.* Three nests observed.

Ruffled Grouse, *Bonasa umbellus.* Three nests observed.

Cooper's Hawk, *Accipiter cooperi* One nest observed.

Acadian Owl, *Nyctala acadica.* One nest observed.

Black-billed Cuckoo, *Coccyzus erythrophalmus.* One nest observed.

Belted Kingfisher, *Ceryle alcyon.* Two nests observed.

Downy Woodpecker, *Picus pubescens.* One nest observed.

Golden-winged Woodpecker, *Colaptes auratus.* Two nests observed.

Night Hawk, *Chordeiles virginianus.* One nest found fifteen miles south-east of Hanover; and others reported by outsiders within three miles of the village.

Chimney Swallow, *Chœtura pelagica.* Many nests.

Ruby-throated Humming-Bird, *Trochilus colubris.* One nest.

Kingbird, *Tyrannus tyrannus.* One nest.

Pewee, *Sayornis phœbe.* Many nests.

Traills' Flycatcher, *Empidonax pusillus*, var. *trailli.* One nest.

Least Flycatcher, *Empidonax minimus.* One nest seen at Grafton Centre, N.H., fifteen miles south-east.

Blue Jay, *Cyanocitta cristata.* One nest at Fairlee, Vt., eighteen miles north.

Crow, *Corvus americanus.* Two nests.

Bobolink, *Dolichonyx oryzivorus.* One nest.

Cowbird, *Molothrus ater.* Three eggs found in a bobolink's nest.

Red-winged Blackbird, *Agelaius phœniceus.* Two nests.

Baltimore Oriole, *Icterus galbula.* Several nests.

Red Crossbill, *Laxia curvirostra.* In 1891 a very young specimen was brought me that apparently must have been raised in this vicinity.

Yellowbird, *Spinus tristis.* Two nests.

Purple Finch, *Carpodacus purpureus.* One nest.

Bay-winged Bunting, *Poocœtes gramineus.* Several nests.

English Sparrow, *Passer domesticus.* Several nests.

Savanna Sparrow, *Ammodramus sandwichensis*, var. *savanna.* One nest.

Chipping Sparrow, *Spizella socialis.* Several nests.

Song Sparrow, *Melospiza fasciata.* Several nests.

Swamp Sparrow, *M. georgiana.* One nest.

Snow Bird, *Junco hyemalis.* One nest observed at Grafton Centre, N.H., fifteen miles south-east.

Indigo Bird, *Passerina cyanea.* Two nests seen in 1891.

Barn Swallow, *Chelidon erythrozaster.* One nest observed.

Purple Martin, *Progne subis.* One nest.

Bank Swallow, *Clivicola riparia.* Two nests.

Cedar Bird, *Ampelis cedrorum.* Two nests.

Great Northern Shrike, *Lanius borealis.* Two nests.

Red-eyed Vireo, *Vireo olivaceus.* One nest.

Yellow Warbler, *Dendroica œstiva.* One nest.

Chestnut-sided Warbler, *Dendroica Pennsylvanica.* One nest.

American Redstart, *Setophaga ruticilla.* One nest.

Oven-bird, *Seiurus aurocapillus.* One nest.

Catbird, *Galeoscoptes carolinensis.* Two nests.

Brown Thrush, *Harporhynchus rufus* One nest.

House Wren, *Troglodytes œdor.* One nest.

Short-billed Marsh Wren, *Cistothorus stellaris.* A nest supposed to be of this species is reported.

Chickadee, *Parus atricapillus.* Two nests.

Tawny Thrush, *Turdus fuscescens.* Three nests.

Hermit Thrush, *T. pallasi.* Two nests.

Robin, *Merula migratoria.* Several nests.

Blue Bird, *Sialia sialis.* Several nests.

Of course this list includes only a portion of the birds breeding here, but it may serve as a basis for future observations.

New Hampshire College.

HOT WEATHER IN MARS.

BY PROFESSOR EDWIN J. HOUSTON.

THE recent severe, protracted, hot weather, that existed in the central and eastern portions of the United States during the latter part of July, formed, in all probability, but part of various general phenomena produced by profound solar disturbances.

So many of the earth's natural phenomena find their origin in the solar radiation, that it is impossible to vary either the amount or the distribution of the solar energy without markedly modifying terrestrial phenomena. Such influences, however, are not limited to terrestrial phenomena; they must extend beyond the earth and be shared by all the members of the solar system.

Natural phenomena form but links in endless chains of cause and effect. An evolution or expenditure of energy, such, for example, as that following a sun spot, produces a number of allied phenomena which are themselves the causes of subsequent phenomena, and these in turn the causes of still other phenomena, the chain extending in most instances far beyond our ken.

There has been unusual solar activity during 1892, as has been evidenced by an unusual number of sun spots. The great spot observed in Philadelphia and elsewhere in the early part of the year was one of the largest ever studied, and since that time numerous other abnormally large spots have appeared.

It would seem that these rather unusual outbursts of solar energy have produced the following terrestrial phenomena, viz.:—

(1.) The recent brilliant auroral displays.

(2.) Magnetic storms, or marked disturbances in the values of the magnetic intensity, in inclination and declination.

(3.) Unusually severe electric storms, as evidenced by the existence of abnormal earth currents. These electric storms are in reality connected with the magnetic storms.

(4.) Marked disturbances in the earth's meteorological phenomena. These have been evidenced by the long spells of unseasonable weather that have occurred so frequently in the United States during 1892, one of which was the recent unusally hot weather before alluded to, the unusual severity of which accords well with the unusual solar activity.

So, too, does the severity of the allied phenomena. Take, for example, the auroral displays, which have seldom been equalled in these latitudes for brilliancy. So also the electric-storms and magnetic-storms, which have been unusually severe during 1892. According to the observations of Mr. Finn and others, as many as eleven such storms were recorded during this time. Their dates were as follows: February 13, March 6, March 12, April 24, April 25, April 26, May 16, May 17, May 18, July 12, and July 16.

The storm of July 16 was unusually severe, and caused great disturbances on the various telegraph lines. The earth-currents were so strong that the lines could be operated entirely by means of earth-currents. This was done, for example, in the case of one of the lines between New York and Boston. On the same day, July 16, an enormous spot appeared on the sun.

And now for possible extra-terrestrial influences and phenomena. The recent opposition of Mars has brought that planet nearer the earth than she has been at any time since 1877, and nearer than she will ever be again until 1909. The opportunity has therefore been particularly good for studying those peculiarities of the surface that have always been of such interest to astronomers.

Some observations recently made on Mount Hamilton appear to show a marked decrease in the mass of snow within the polar caps, as is inferred from certain characteristic markings at these points of the planet. This disappearance is unusual, and would seem to indicate unusually hot weather in our sister planet. The Martian thermometer has probably been way up, and the weather has, to form a phrase from the fiery color of the planet, been at a red-heat.

We may add, therefore, another effect produced by the unusual sun-spot, viz., 5. The extra-terrestrial effects.

Of course the influence may be mutual. It may be that the unusual proximity of Mars may be the cause of the great number of spots, in which case we may thank Mars for the recent terrific heat.

"FLATHEAD" DEER.

IN the *American Naturalist* for August, 1887, were given some instances of the occurrence among deer of hornless specimens. Here we shall summarize these, preparatory to giving in full some original particulars furnished us by a German correspondent.

Lord Lovat is quoted as having seen *humle* (hornless) stags. They are able to thrash stags of their own or greater than their own weight. Several of them were undisputed masters of large herds.

Mr. Horatio Ross has also shot them. They are more frequent than generally supposed. They are no whit inferior to their horned brethren. A full-grown *humle* is very formidable in fight. During the rutting season Mr. Ross has seen one in possession of a large herd of hinds, who drove off all rivals.

Both these gentlemen's experience refers to Scotland. The following mentioned special cases refer to Germany. H. von Nathusius of Altaldensleben, Saxony, and Ludwig Beckman have supplied very interesting information which is well worth reading to those interested in venery.

These hornless deer occur wild, they write, and are very fertile and impressive. In the *Illustrirte Zeitung*, published in Leipzig (Oct. 2, 1886), there is a picture of a fight between a horned and a hornless stag, in which the hornless stag displays the mastery. Hornless stags have been mentioned in German sporting literature since the seventeenth century.

These are cases of what is regarded as variation, but which really appear to be referable to atavism, as will be immediately seen.

There are two species of deer that are normally destitute of horns as a characteristic. The first of these is the musk-deer; these have peculiarly long canine teeth. These (*Moschus moschiferous*) are natives of Thibet and Nepaul. The second is the water-deer, *Hydropetes inermis*. It is found in the marshes of the Yangtze, above Chin-kiang, China. The Chinese are strongly averse to the flesh, which Europeans, for want of better, pronounce tolerable.

Passing from living to extinct forms of deer, we find that, tracing them backwards, they become more and more simple as to horns, till reaching the lower miocene no member of the family is possessed of antlers. It will thus be admitted that the claim that instances of hornless deer of the present time are only cases of atavism, or reversion to the early condition of the head of the species, is simply the truth. Further, the above facts prove that horns are of the nature of acquired characters — a rather interesting fact just now to bring out in connection with the Wiesmannia that is raging.

The following is a translation of the communication we received from our German correspondent:—

"The hunter of the deer species has for long designated the deer which are destitute of antlers by the name of 'flat-heads,' or *mœnche*. On the skull of such deer appears a so-called *hornbase*, usually the real bearers of the antlers, remarkably stunted and entirely overgrown with the elongated hair of the forehead. The cause of such striking appearance is often held to be the long-continued inbreeding occurring in certain districts, or the lack of new blood obtained by bringing in deer not related.

"If we notice how the deer and roebucks which have been confined for domestication and freely fed with oats, rye, peas, corn, acorns, chestnuts, and beechnuts, often develop uncommonly large and branching antlers, it seems just to conclude that a lack of these and other means of nourishment hinders the growing of horns. In fact the so-called